

50th PSLV and Basics of PSLV

April 25, 2020

Context: PSLV-C48 was the 50th mission of PSLV

- PSLV-C48 was carrying the RISAT-2BR1 (primary satellite), a radar-imaging earth observation satellite.
- The satellite will be used in applications such as agriculture, forestry and disaster management support.
- Weighing about 628 kg, the satellite was placed into a 576-km orbit at an inclination of 37 degrees.
- The PSLV-C48 also carried nine international satellites – six from the US and one each from Israel, Italy and Japan. These international customer satellites were launched under a commercial arrangement with NewSpace India Ltd.
- The PSLV-C48 is the second flight of PSLV in 'QL' configuration with four strap-on motors.
- This was the 75th launch vehicle mission from Satish Dhawan Space Centre (SDSC) SHAR, Sriharikota,

Details

- Polar Satellite Launch Vehicle (PSLV) is the third generation launch vehicle of India. It is the first Indian launch vehicle to be equipped with liquid stages.
- PSLV earned its title 'the Workhorse of ISRO' through consistently delivering various satellites to Low Earth Orbits, particularly the IRS series of satellites. It can take up to 1,750 kg of payload to Sun-Synchronous Polar Orbits of 600 km altitude.
- Between 1994 and 2019, the PSLV launched 50 Indian satellites and 222 foreign satellites for over 70 international customers from 20 countries. It also successfully launched two spacecraft – Chandrayaan-1 in 2008, which made its way to the moon and the Mars Orbiter in 2013, to Mars.

- The PSLV has launched satellites in polar/GT0 orbit, and has also been used in Mars and Moon missions, and will soon be used in a mission to the sun.

Parameters

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| Height | : 44 m |
| Diameter | : 2.8 m |
| Number of Stages | : 4 |
| Lift Off Mass | : 320 tonnes (XL) |
| Variants | : 3 (PSLV-G, PSLV – CA, PSLV – XL) |

- **Fourth Stage: PS4**, The PS4 is the uppermost stage of PSLV comprising of two Earth storable liquid engines.
- **Third Stage: PS3**, The third stage of PSLV is a solid rocket motor that provides the upper stages high thrust after the atmospheric phase of the launch.
- **Second Stage: PS2**, PSLV uses an Earth storable liquid rocket engine for its second stage, known as the Vikas engine, developed by Liquid Propulsion Systems Centre.
- **First Stage: PS1**, PSLV uses the S139 solid rocket motor that is augmented by 6 solid strap-on boosters.

Strap-on Motors

PSLV uses 6 solid rocket strap-on motors to augment the thrust provided by the first stage in its PSLV-G and PSLV-XL variants. However, strap-ons are not used in the core alone version (PSLV-CA).